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## Supply Chain Management in Services

Manufacturing industries have implemented and benefited from supply chain management (SCM) practices for years. Yet the bulk of U.S. industry is in services (in particular, most of the growth industries are in services), and they too can derive substantial benefits from the use of SCM principles; indeed, many have done that already. The characteristics of manufacturing and service operations are listed in Table 1, and a comparison of traditional approaches versus SCM is given in Table 2. Here we will present some of the tools that can be used in the implementation of SCM in service industries, and discuss their benefits and limitations.

Supply chain management is defined as an "integrative philosophy to manage the total flow of a channel from earliest supplier of raw materials to the ultimate customer and beyond—including the disposal process".<sup>1</sup> It replaces the local optimizations within each component of the supply chain in favor of reaching a global optimum. For example, it has been estimated that the U.S. food industry can save \$30 billion annually through better SCM. It also supports the "market median function," which is to ensure that products that reach the market are really what consumers want.

### SCM TOOLS USEFUL IN SERVICE INDUSTRY

Many ideas from different business disciplines are useful in the implementation of SCM. Relationships from the realm of marketing, technology, forecasting, outsourcing, and just-in-time purchasing from operations, and cost management from accounting are some of the tools we find useful, and these are discussed in more detail below.

#### Relationships

Inherent interpersonal focus and lack of objective measures of quality in service industries lead to a strong reliance on customer relationships. Well-managed customer relations management (CRM) benefit businesses through lower customer turnover and predictable sales, which lead to higher revenues, lower costs, and new business generated through

word of mouth. Customers benefit too, and these benefits are categorized in Table 3.

Another type of relationship is that between the companies within the supply chain. Traditionally this has been only between the sales of one and the purchasing of the other, through their account managers. As more interaction and trust develops between the two companies, relationships develop among all functional areas of the two companies.

There are many reasons why these relationships develop. Oliver<sup>2</sup> suggests the following:

- necessity (such as to meet legal requirements)
- asymmetry (when some companies dominate the industry)
- reciprocity (when operations are smoothed between both companies)
- efficiency (improvement of internal operations within a company)
- stability (improved trust among partners)
- legitimacy (such as being in partnership with a Fortune 500 company).

It should be noted that several software systems for managing relationships have emerged in the past few years, such as Siebel and PeopleSoft. The estimated growth in CRM services is shown in Table 4.

#### Technology

There are several technologies that enable SCM processes. The enhancements to manufacturing resources planning (MRP II) leading to enterprise resources planning (ERP) and advanced planning and scheduling (APS) aid businesses along the supply chain to link their applications to each other and automate materials management processes. Electronic data interchange (EDI) enabled secure and fast transfer of information needed for business transactions, making vendor-managed inventory possible. But the biggest impact for SCM comes from Internet technology and the resulting surge in e-commerce transactions.

In spite of the recent downturn in the e-commerce market, Internet technology is here to stay and will experience substantial growth. It aids SCM through the integration of internal functions with applications connecting shippers, suppliers, and

<sup>1</sup> Cooper, Martha C., Lisa M. Ellram, John T. Gardner, and Albert M. Hanks, "Meshing Multiple Alliances," *Journal of Business Logistics*, vol. 18, no. 1 (1997): 67-89.

<sup>2</sup> Oliver, Christine, "Determinants of Inter-organizational Relationships: Integration and Future Directions," *Academy of Management Review*, vol. 15, no. 2 (1990): 241-265.

customers, which results in reduced inventory risks and higher sales for products with short life-cycles. The instantaneous transfer of information leads to easier order-entry processes, decreased paper handling, and less rekeying of information, resulting in higher productivity, better accuracy and customer service, and stronger relationships.

There are a variety of ways in which e-commerce is implemented. Timmers<sup>3</sup> identifies the following business models for e-commerce:

- e-shops (online sales)
- e-procurement (online purchase)
- e-auction (online bidding)
- e-mall (a collection of e-shops)
- third-party marketplace (common marketing and transaction support to multiple businesses)
- private markets or exchanges
- virtual communities (enabling communication between members)
- value chain service provider (supporting say logistics or payments)
- value chain integrator (adding value by integrating multiple steps of the value chain)
- collaborative platforms (such as collaborative design)
- information brokers (providing authentication services, business information, and consultancy).

Technology should be used only to achieve business goals; it should not be pursued for its own sake. The drawbacks of new technologies are security concerns, lack of skilled people, the large expense, and high risks of failure. It should also be remembered that in time technology becomes available to all, and thus will not remain a competitive advantage even for those who develop it.

### Forecasting

Implementation of any SCM process depends heavily on accurate forecasts for the improvement of efficiency of product distribution, reduction of inventories, and the resulting improvement in customer services. Poor forecasting can lead to inefficiencies, need for overtime and thus higher costs, high logistics expenses, and ultimately, decreased customer services.

The bullwhip effect in supply chains is the increasing variability of projected demand as information is conveyed upstream through the chain. It can be shown that a poor forecasting system can easily lead to the bullwhip effect. Sharing of information can alleviate the problems caused by the bullwhip effect.

### Outsourcing

Increasing costs, complexity, specialization, and commercial uncertainty drive companies to outsource many of their products and processes. In service firms, customer satisfaction is of utmost importance, and therefore control over outsourcing is crucial. Thus procurement becomes an important link in ensuring quality, reliability, delivery, and cost containment.

The economist Coase had argued that in a market-driven economy, it is natural for firms to outsource their non-core activities, and yet many firms continued to do them in house. The reason for this, according to Coase, was the presence of many hidden transaction costs. It may be argued that the new information infrastructure makes these costs transparent as well as reduces them, leading to increased use of outsourcing in the present economy.

### Just-in-Time Purchasing

As with manufacturing companies, service firms can also implement Just-in-Time purchasing to streamline the use of their inventory. Often the main benefit is a reduction in the amount and cost of inventory carried, and the customers are served with the latest or most fresh product. It also results in a more disciplined environment, leading to continuous improvement, higher quality, and higher employee morale, all of which boosts customer satisfaction.

The downside is that any disruption to the delivery systems (by causes such as strikes) can wreak havoc with service levels—thus alternative sourcing and contingency planning become very important.

### Cost Management

All businesses strive to understand and manage their costs. However, traditional cost management methods may not be appropriate in evaluating the costs of a business that implements SCM. To understand the costs properly, we need a system that evaluates all factors that contribute to the total costs, including the cost of time and quality. This requires a choice of the right accounting system, which may incorporate activity-based costing.

### BENEFITS AND LIMITATIONS

Implementation of SCM in service industries can result in decreased lead times, faster product development, improved quality, reduced costs, and higher customer service. Collaborative design can reduce lead times substantially and create a synergy that would not otherwise be possible. Technology makes service enhancements possible, leading to higher customer satisfaction. Better forecasting and Just-in-Time purchasing contributes to reduced costs, and these are identified through proper cost

<sup>3</sup> Timmers, Paul, "Business Models for Electronic Markets", [http://www.electronicmarkets.org/netacademy/publications.nsf/all\\_pk/949](http://www.electronicmarkets.org/netacademy/publications.nsf/all_pk/949) (2001).



management systems. But ultimately, the rationale for using SCM is that it improves competitiveness.

There are many impediments in the path towards SCM. It must be approached in a holistic way, and both employees and management must be committed to it. Traditional corporate culture and ways of doing things would have to change—for example, emphasis on short-term results and fast profits must go, and employees must recognize external as well as internal customers. Change is always resisted—hence through proper dissemination of information and through training, employees must buy into the new approach, and at the same time be allowed to participate in decisions and implementations and be given outlets for expressing any

negative feelings or frustrations. Just-in-Time purchasing is particularly vulnerable to disruptions, which makes it more imperative to have long-term relations with suppliers.

#### **ABOUT THE AUTHORS**

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Characteristic	Manufacturing	Service
Output	Tangible	Intangible
Customer Contact	Low	High
Customer Involvement	Low	High
Uniformity of Input	High	Low
Labor Content	Low	High
Uniformity of Output	High	Low
Measurement of Productivity	Easy	Difficult
Opportunity to correct quality problems before delivery to customer	High	Low

Source: William J. Stevenson, *Production Operations Management*, Irwin/McGraw-Hill, 1999, p. 14.

**TABLE 1. CHARACTERISTICS OF MANUFACTURING AND SERVICE OPERATIONS**

Element	Traditional	SCM
Inventory Management Approach	Independent efforts	Joint reduction in channel inventories
Total Cost Approach	Minimize firm costs	Channel-wide cost efficiencies
Time Horizon	Short term	Long term
Amount of Information Sharing and Monitoring	Limited to needs of current transaction	As required for planning and monitoring processes
Joint Planning	Transaction-based	Ongoing
Compatibility of Corporate Philosophies	Not relevant	Compatible at least for key relationships
Breadth of Supplier Base	Large to increase competition and to spread risk	Small to increase coordination
Channel Leadership	Not needed	Needed for coordination
Amount of Sharing of Risks and Rewards	Each on its own	Risks and rewards shared over long term
Speed of Operations, Information and Inventory Flows	"Warehouse" orientation (storage, safety stock) interrupted by barriers to flows	"DC" orientation (inventory velocity) interconnecting flows; JIT, Quick response across the channel
Information Systems	Independent	Compatible, key to communications

Source: Martha C. Cooper, Lisa M. Ellram, John T. Gardner, and Albert M. Hanks, "Meshing Multiple Alliances," *Journal of Business Logistics*, vol. 18, no. 1 (1997): 67-89.

**TABLE 2. COMPARISON OF TRADITIONAL AND SCM APPROACHES**

Social Benefits	<ul style="list-style-type: none"> <li>- Personal friendships with providers</li> <li>- Personal recognition</li> </ul>
Psychological Benefits	<ul style="list-style-type: none"> <li>- Feeling of security</li> <li>- Reduced anxiety</li> <li>- Trust and confidence</li> </ul>
Economic Benefits	<ul style="list-style-type: none"> <li>- Discounts or price breaks</li> <li>- Quicker service</li> <li>- Time saved in looking for new provider</li> </ul>
Customization Benefits	<ul style="list-style-type: none"> <li>- Preferential treatment</li> <li>- Additional consideration or services</li> <li>- Fewer hassles</li> </ul>

Source: Gwinner, Kevin P., Dwayne D. Gremler, and Mary Jo Bitner, "Relational Benefits in Services Industries: The Customer's Perspective," *Journal of the Academy of Marketing Science*, vol. 26, no. 2, Spring 1998, pp. 101-114.

**TABLE 3. CUSTOMER BENEFITS IN A LONG-TERM RELATIONSHIP**

	Worldwide CRM software revenues (in billions)	Worldwide CRM services revenues (in billions)
1999	\$3.7	
2000	\$5.4	\$44.0
2001	\$7.9	\$57.4
2002	\$11.5	\$74.6
2003	\$16.8	\$97.8
2004		\$125.2

Source: AMR Research, 2000, and International Data Corp. (IDC), 2000, as reported in <http://www.emarketer.com/reports/crm/welcome.html>

**TABLE 4. ESTIMATED GROWTH OF CRM SOFTWARE AND SERVICES**